W099 – Safety and Health on Construction Sites

Report on the Designing for Safety and Health Conference

London, United Kingdom, 26-27 June 2000

by

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The Conference

115 international delegates joined the Designing for Safety and Health Conference on 26-27 June 2000, with the aim of developing an "agenda for change towards designing for safety and health" and to examine the role of design in reducing accidents and health risks. The conference was organised by the European Construction Institute (ECI), CIB Working Commission W099 and the UK Health & Safety Executive (HSE). Delegates represented industry, governments, universities and research institutions from more than 14 countries.

The conference produced a fully refereed, multi-authored proceedings of conference papers, summary of key issues, keynote presentations from leading researchers and practitioners and break-out sessions.

Keynote Papers

Several keynote papers were presented to act as stimuli for the breakout discussion sessions. Jacques van Goolen of major petro-chemical owner DSM Polyolefine GmbH, Germany, gave the first presentation explaining why clients are interested in health & safety. Roy Duff, from UMIST-Manchester, leading
researcher on accident causality, discussed whether design causes accidents or not. Jimmie Hinze from Florida raised the life-cycle issues of designing for the safety & health of maintenance and demolition workers. Richard Ash of the UK-based Engineering Construction Industry Association discussed the important role of legislation. The designer’s perspective was presented by Thouria Istephan of Foster & Partners Architects and Phil Knight-Jones combined with Hugh Wakeling of Foster Wheeler Energy to demonstrate the need to integrate design and construction.

Breakout Sessions
The breakout sessions were an important feature of this conference covering:
- Designing for safe & healthy construction
- Accident causality - the role of design
- Getting the H&S message throughout the project - Communication & information
- Planning for the future - education & training
- Designing for the life-cycle
- Making legislation count
- Integrating Design & Construction
- Getting the best from designers

Proceedings
The conference proceedings (TF005/4) consist of 29 papers from a wide range of international authors and are available to purchase for £30.00 or Euro 47.11. To purchase a copy of the publication or for any other information please contact: European Construction Institute Sir Frank Gibb Annex West Park Loughborough, LE11 3TU United Kingdom Tel: +44.1509.223526 Fax: +44.1509.260118 E-mail: ECI@lboro.ac.uk

Or for further information on the keynote presentations and abstracts please visit the ECI website: http://www.eci-online.org

Agenda for change
The design stage of a construction project is where major improvements in health and safety can be achieved. However, there are real challenges for everyone involved in the construction process in order to achieve a step change in designing for safe and healthy construction and operation of buildings and facilities. To date there have been many factors that have limited improvements in this area such as lack of commitment, time, communication, funding and understanding. The culture of the segmented construction industry and fragmented process along with clients’ unwillingness to appreciate designing for safety must be addressed to break through into a new arena of working practice and performance.
This Agenda for Change was developed from the breakout sessions and workshops at a major international conference on Designing for Safe and Healthy Construction organised by the European Construction Institute (ECI) and CIB W099 in London in June 2000.

In particular change is required for designers, clients and their managers. Changes in project processes, communication, education and training are also essential.

**Change for Designers**
- Involve the designers in the whole project process
- Recognise that designs will dictate, to a considerable degree, the nature and extent of hazards that will pose a threat to worker safety during construction and the life cycle
- Achieve better risk identification
  - Concentrate on significant risks which competent contractors could not be expected to be aware of when executing their works rather than on straight-forward residual risks
  - Utilise different levels of risk assessment at different stages in the project
- Concentrate on interfaces between elements and organisations as the main area where breakdown of communication and understanding occurs
- Make H&S a number one priority in the design process
- Ensure health issues are not neglected in H&S considerations
- Consider H&S implications earlier
- Recognise the duty to consider H&S in design and designers’ impact on construction activities as part of a holistic approach (ECI guidance on duties and hazard management of projects at each phase from concept to demolition)
- Develop better awareness of safe working practices and ergonomics
- Maximise the use of innovations that reduce H&S risk, such as pre-assembly / off-site manufacturing or standardisation of equipment. The advantages (and disadvantages) must be known
- Overcome resistance to change and commercial pressure to do nothing
- Use appropriate tools such as:
  - Computer aided integrated safety and health design system database to design documents to create safety and health plan. The computer based information system serves as a checklist of information that can be included in the safety and health plan
  - 3D CAD system to examine the project in the design stage to see if it works. This process results in significant cost savings for example the omission of details may be eliminated or reduced
Safety constructability reviews contributing considerably to addressing construction worker safety in the design

Lessons Learnt Database would ensure that good ideas will survive for the benefit of others. A group or agency is needed to champion this effort for the collection and dissemination of best practices

Feedback loops, knowledge management, 3D modelling and defined interfaces to reduce the unplanned element of construction work through design

Consider the entire life of the facilities in a holistic manner

Design for safe access as probably the most important issue for maintenance personnel including access for routine maintenance and to install replacement equipment

Include risk assessments for decommissioning or deconstructing facilities. This information should be kept in the health and safety file (CD Format) for future use

Change for Clients and their Managers

Remove the division between designers and constructors thus allowing pre-construction discussion and post construction feedback

Challenge prevailing culture where many have an entrenched attitude that does not lend itself to viewing H&S as an essential element to good management practice

Employ targets such as CRAM (Constructable, Reliable, Available, and Maintainable), or SACP (Safe and Constructable Project) throughout the project team

Demonstrate visible commitment by the clients to H&S through clear definition/policy, together with clear H&S requirements in Tender Documents and pre-award meetings, could set the scene for the remainder of the project

Ensure adequate time and money to enable design to incorporate best H&S practice
Aid good communication between all parties including round table discussions by all parties throughout the project
- Communicate and co-operate with the designers and let them do their job
- Institute control of H&S issues by implementing incentives, reviews and value engineering programmes
- Include designer commitment to design safety as part of the competence review
- Implement project (design) audit systems using independent facilitators
- Communicate and co-operate with the designers and let them do their job

**Changes in Project Processes**
- Greater use of an integrated team approach will address fragmentation of the designers, constructors, maintenance personnel, and the traditional facility users
- Choose appropriate procurement routes to maximise co-operation throughout the project team (e.g. Partnering)
- Mobilise the Principal Contractor/Construction Phase Co-ordinator early to assist designers in constructability reviews
- Construction personnel need to be more involved in the design, to ensure that construction managers attend all design reviews, preferably with a construction contractor/consultant
- Improve H&S performance by Benchmarking/Best Practice, Performance Indicators, and long term planning

**Changes in Communication**
- Better and more thorough communication of risk issues throughout the project team. Designers>>Contractors’ Managers>>Supervisors>>Operatives
- Project organisation to allow for the establishment of proper communications procedures
- Round table discussions by all parties throughout the project
- H & S information needs to be properly communicated throughout the project
- Improved use of I.T. tools for communication
- Improved structure of communication
- Address construction industry fragmentation and work to communicate common health and safety goals
- Better feedback from contractors to designers on safety and health issues
- Face up to the challenge of communicating design risks to sub and sub-sub contractors

Luis Alves Dias (Portugal) tries to walk away from an awkward question in the legislation breakout.
Changes in Education and Training

- Additional training for all levels of management
- Training for designers on construction knowledge and experience to equip them to focus on hazards
- Particularly improve the training on health issues as these have traditionally been neglected
- Providing training on H&S approaches throughout the world
  - Consider Italian and French experience of defined training and education for designer
- Train academics to deliver integrated education at University, Schools and Colleges so that designers consider H&S as part of the whole process
- Appropriate training for site personnel in the use of the innovative techniques must be in place